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Claim 1 (twice amended). An integrated semiconductor circuit, comprising:

a plurality of pad cells to be monitored in one operating mode by a functional test, said plurality of pad cells each having a connecting pad, an upstream output driver, and a connection for an input signal;

a signal transmitter for producing periodic signal sequences, said signal transmitter having a connection for a periodic output signal connected to said (connection) connections for an input signal of said plurality of pad cells to be tested, in order to test a transmission response of said plurality of pad cells in said one operating mode; and

shift register cells each connected in series between said connection for an input signal of a respective one of said plurality of pad cells and said connection of said signal transmitter for an output signal;

said connections for an input signal of said plurality of pad cells being connected in parallel to said connection of said signal transmitter for an output signal.

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2. The integrated semiconductor circuit according to claim 1,  
wherein said signal transmitter is reprogrammable to produce  
different periodic signal sequences.

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Claim 5 (amended). The integrated semiconductor circuit  
according to claim 1, including multiplexer circuits each  
connected between said connection for an input signal of a  
respective one of said pad cells and said connection of said  
signal transmitter for an output signal, to switch over  
between said one operating mode and another operating mode.

6. The integrated semiconductor circuit according to claim 5,  
including:

another functional unit having a connection for a signal;

each of said multiplexer circuits having an output connected  
to said connection for an input signal of a respective one of  
said pad cells to be tested;

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each of said multiplexer circuits having one input connected to said connection of said signal transmitter for an output signal;

each of said multiplexer circuits having another input to be connected to said connection for a signal of said other functional unit;

the output signal from said signal transmitter being present at said output of said multiplexer circuits in said one operating mode; and

the signal from said other functional unit being present at said output of said multiplexer circuits in said other operating mode.

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**Claim 2 (amended).** (The) an integrated semiconductor circuit  
(according to claim 1, wherein) , comprising:

a plurality of pad cells to be monitored in one operating mode  
by a functional test, said plurality of pad cells each having  
a connecting pad, an upstream output driver, and a connection  
for an input signal;

a signal transmitter for producing periodic signal sequences,  
said signal transmitter having (said signal transmitter  
contains) a clock-controlled bistable multivibrator of the T-  
flip-flop type and a connection for a periodic output signal  
connected to said connection for an input signal of said  
plurality of pad cells to be tested, in order to test a  
transmission response of said plurality of pad cells in said  
one operating mode; and

shift register cells each connected in series between said  
connection for an input signal of a respective one of said  
plurality of pad cells and said connection of said signal  
transmitter for an output signal.

8. A method for testing a transmission response of pad cells  
in an integrated semiconductor circuit according to claim 1,  
which comprises:

connecting an output of a pad cell to be tested to a measurement input of a measurement configuration suitable for spectrum analysis; and

measuring a transmission response of the pad cell in a frequency domain using the measurement configuration.

9. The method according to claim 8, which comprises measuring at least one of an amplitude response and a phase response of a recorded frequency spectrum.

10. A method for testing a transmission response of pad cells in an integrated semiconductor circuit according to claim 1, which comprises:

connecting an output of a pad cell to be tested to a measurement input of a measurement configuration suitable for spectrum analysis; and

measuring a transmission response of the pad cell by direct-current measurement at an output of the pad cell.

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